OC31 – 24988 - EXTRACTION OF CAROTENOIDS SUPPORTED BY OHMIC HEATING AND CHARACTERIZATION OF BIOLOGICAL PROPERTIES AND STABILITY THROUGHOUT GASTROINTESTINAL TRACT

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Abstract

Carotenoids are lipophilic isoprenoid compounds with a polyene backbone that contains a variable number of conjugated double bounds, being precursors of aroma compounds. They are important in human nutrition since they are a source of vitamin A (β-carotene). Several studies have linked the regular consumption of carotenoids to prevent human diseases, such as cardiovascular, cholesterol, neurodegenerative diseases, antioxidant and anti-cancer. Very little is known about release of entrapped carotenoids from complex matrixes and their impact on the gut microbiota. Extractable carotenoids were obtained from tomato by-products through green efficient process using ohmic heating (OH). The extracts were submitted to simulated gastrointestinal tract and digested samples were subjected to fermentation using faecal matter from 5 different controlled donners (male and female alike). The total carotenoids were assessed by spectrophotometric method. Individual carotenoids and carotenoids-derived aroma compounds during each step of digestive tract and from the microbiota assay were also analysed by LC-MS and LC-HR-QTOF-MS, respectively. The short-chain fatty acids (SCFA) and lactic acid and sugars from microbiota assay were analysed by HPLC. The human faecal microbiota was assessed by real-time quantitative PCR. Prebiotic, anti-hypertensive activity, anti-inflammatory activities were also evaluated. In the OH extract, the major carotenoids identified were lycopene and b-carotene (corresponding to 92% of total carotenoids). After digestion process and fermentation only carotenoids-derived aroma compounds and other metabolites resulting the carotenoids were found, including camphenol, linalool acetate, (+)- sabinol, acetovanillone and hexadecanedioic acid. The results suggest that

fermentation of OH tomato by-product extract demonstrated a prebiotic effect through the increasing of the number of *Bifidobacterium animalis* and improving the production of SCFA, approving a potential modelatory effect upon the gut microbiota and consequently providing a prevention of numerous diseases. Complementary, the OH extract also proved anti-inflammatory activity and moderate anti-hypertensive activity.

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